BEDES Technical Working Group
Second Meeting at NRDC and via phone/ReadyTalk—January 22, 2014 (1:30-4:30)
Convener: Norm Bourassa, LBNL
Facilitator: Dr. Jonathan Raab, Raab Associates, Ltd.

Meeting Summary

1:30 Welcome, Introductions, and Today's Agenda
1:40 Progress of Sub-Groups (Review recommendations and get input on any unresolved issues)

Andrea, LBNL, reviewed with the group the recommendations from the Commercial and Residential Sub-Groups on issues in BEDES related to the complex type and facility type sections—asking the TWG if it had any clarifying questions, or any concerns or disagreements with particular recommendations. What follows is a summary of questions or concerns/disagreements raised and responses or resolutions. SEE BEDES Technical Sub-Group: Working Group Progress slides (Commercial, Residential on website for recommendations from Sub-Groups). When there is no mention of specific recommendations in the meeting summary, this indicates that no questions/concerns were raised about those recommendations during the discussion, and so are considered approved by TWG.

- **Site—Commercial and Residential**
  - **Complex type-**
    - **Mixed Use**—TWG Members asked about how you would distinguish in BEDES between "commercial mixed use" and "mixed use with multi-family" and whether this was necessary. LBNL staff clarified that you would pick the latter if there is any residential space in the building, but that there's no percentage cut-off. This field is more to help parsing through buildings for various use cases.

    - Members suggested that multiple types should be selectable to designate the mix instead of Mixed Use enumerations. LBNL explained that having a Mixed Use designation is also important, rather than simply having list of different uses, because the different uses may not always be separately metered. Commercial and Residential facilities within a complex would be separately metered

    - *Members raised a potential issue with the field name "Complex Type" and the software term relating to data type. LBNL will have to change the field name to alleviate this confusion*

- **Site Resolutions- Additional Fields**
    - **Current Use/Possible Use**
        - Need to look at HXPML and clarify definitions of these two terms
    - **Distance from Train**
        - TWG agreed to change field name to "Distance to Train"

- **Facility—Commercial**
    - **Building Certification Type**- There were no issues with expanding the list to include additional certification types identified by Sub-Groups. However, TWG members raised concerns about how to handle new Certification Types that may arise more rapidly than the BEDES ability to adapt. TWG Members agreed that having an "Other" category could solve this. Some also felt that having a free text field to fill in additional Certification Types would be useful, while others felt that this could be counter-productive.
    - **Day-lit Floor Area** (A new proposed field to define the floor area that is lit by natural daylight). TWG member wants to know whether this requires a control system to remove electric lighting or just somewhere with a window?
        - LBNL will write an accompanying description with this field that will be consistent with established definitions.
- **Facility—Residential**
    - **Orientation/Azimuth**- Recommendation from Residential Sub-Group was to change "Orientation" to "Cardinal Direction" and adjust definition to use front of facility as the reference point; and to add a new "Azimuth" field to capture the degrees from North (clockwise). TWG discussed whether having both would create confusion and even conflict. Some argued that if you go with "Azimuth" we don't need "Cardinal Direction" as well, while others felt that having the option to do either or both would be useful given a wide range of likely users and data availability. Some opined whether this could be addressed through meta-data and tagging. There was also sentiment that whatever is done in this area for residential should also apply to commercial in BEDES.
    - **Building Certification Type** – TWG agreed to expanded list provided by the Sub-Group.
        - Add "Energy Efficiency Certificate of Compliance" to the enumerated type list.

The TWG agreed to move the following issues that were unresolved in the Sub-Groups to the next TWG meeting, as there was not enough time to address in this call.

- **Facility**:
    - **Footprint Shape** – Should BEDES capture more granular geometric dimensions of facilities?
    - **Metering Configuration** – Tabled to the next subgroup meeting dealing with Energy Use and Time Series tables.

- **Activity Area**:
    - **Connected Load** – Field comes from ESPM to capture connected load to specific activity areas. What about capturing peak load info?
    - **Residential Activity Area** – Is there a need to provide activity areas for Residential Facility to capture specific space-level information regarding common areas, recreational space, manager's office, etc.?

2:10 Prioritization of Fields

LBNL and the meeting Facilitator summarized the discussion on Fieldname prioritization during the first TWG meeting (TWG1 slides on website), and asked the TWG again whether it felt BEDES should have a prioritization, and if so based on what criteria. LBNL decided to revisit this topic because the first TWG meeting discussion did not ask the basic question around whether it is a proper role for BEDES to call out any fields as being more important than others. (SEE Prioritization Slides on website). Some of the points made during the discussion included:

- Is there an argument for, and if so, what?
- Options vastly overwhelm people at times. That is where prioritization comes in. You have to tell them which piece of the puzzle is most important to you.
- If you can identify which use case a particular field is relevant for (e.g. audit use case, or audit program evaluation) that would be useful.
- Possible to do this for the first three main use cases, but not going forward for all possible future uses of BEDES
- Maybe BEDES should just have a built-in facility so that users (eg., source code implementers) are able to identify which fields are most important to them, thus allowing different use cases to define their own subset or "model view" that clients and services utilize.
- BEDES needs to facilitate functionality that allows the client the option to prioritize certain fields themselves, without a priori prioritizing fields for them.
- Another way to think about prioritization might be required vs. optional fields. You want to know which fields are required vs. optional. E.g., Energy Star Portfolio Manager (PM) will put in a default field when you leave it blank. On top of that – cities may have required fields from PM that differ from PM's required fields.
- If we take this off the table for the TWG that will save a huge amount of time and effort
- Does BEDES need the capability to designate something as high priority – procedure or meta-data for doing so, without actually doing it?

In summary, there was a strong sentiment among most of the TWG Members that the formal and structural prioritization of fields within BEDES would not be appropriate as well as very time-intensive. That said, many TWG Members also felt that understanding which fields are most important to specific use cases, for starters the three starting use cases currently proposed, would be beneficial. However, there was general sentiment that the identification of those fields (be

they high/low priority, required/optional, etc.) should be left to the gatekeepers of those use cases rather than hard-wired into BEDES. We agreed to think further about how BEDES might facilitate prioritization by users, as well as finalize the prioritization recommendations at the next TWG meeting.

3:10 **Grouping Structure**

LBNL and the facilitator summarized the discussion on Grouping Structure from the first TWG meeting, and showed some different grouping structure examples using both a generic animal theme and a specific section of BEDES. This was done in order to recap what the team feared was a misunderstanding about basic data organization concepts discussed in the first TWG meeting. The team then asked the TWG again what grouping/hierarchy structure it felt made most sense for BEDES and why. (SEE Grouping Structure slides on the website.) Some of the points made during the discussion included:

Arguments related to Option 1—Totally Flat

- I Feel strongly about a flat structure- Easier to modify, expand and utilize for different purposes. Using a "tag" approach might also be an option
- Keep it as flat as possible--leaving the business logic and structure to the implementers; don't try to make logic decisions about the data being shared. You are running the risk of pushing a predetermined logic model into an implementer's area of development and that model might not be right for any given data transaction
- The project is confusing the difference between data objects and data model or schema. The objective here is to define terms and say what the data means. It is up to the implementers to establish their needed schema and model structure
- From a programming standpoint, it is a dictionary not grammar.
- In object oriented programming language, you can choose anything more granular and it will know that it belongs in the level above as well.
- Every time we force a definition on the next layer we are already making assumptions about the layers around it. We need to keep the structure sparse and let people construct their own data 'sentences'
- In the flat model, if there is an instance where there is a dual meaning for a field across multiple levels of granularity, we will have to deal with the conflict using syntax identifiers in the description or fieldname
- Flat is optimal, but there are concerns for how people will use this. Down the line, we can talk about how it is communicated to people. We should move forward with "flat" and deal with issues as they occur

Arguments related to Option 2: Hierarchical Sub-Types, but Separate Attributes

- There is always going to be some kind of pairing. But we want this to be useful and be able to understand it when they read it. If there is always going to be some type of pairings between types and sub-types, as in option 2, then possibly it makes the most sense for people to understand it and put it to use

- When it is flat, it is often hard to understand what's available in a given dataset. In addition, a flat structure co-mingles differences in data granularity all at a same level. For that reason, an imposed hierarchy can help to impose some consistency on the software developers.
- It is not fully hierarchical; you have taken all of the type descriptors, and rolled them up into one activity type.
- Equipment specific descriptions are also like this with types and sub-type.
- Would there be a risk of not enumerating all possible sub-types, for example with equipment – could get sticky if you try to force combinations on folks
- The question is, do we force a hierarchy on people, that we me make that decision, or do we assume that by and large, they will make consistent decisions
- In BPD it was discovered that with the Systems data elements they had to do some linkages and hierarchy organization. There are now basically 28 categories – we have commercial facility etc then when you get to systems there are a bunch of sub-systems levels in order to capture the natural system dependencies

In Summary, none of the TWG Members supported Option #3 a full hierarchical approach, and while most TWG Members strongly favored Option 1 (Flat) Grouping Structure, some TWG Members felt that a limited version of Option 2 (Hybrid—Hierarchical Sub-Types but Separate Attributes) made sense when certain combinations were virtually always connected with one another. Potential next steps included:

  - Having LBNL look at how many candidate locations in the Spec exist for an Option 2 Hybrid approach – e.g. places where things are normally paired together—and bring examples to next TWG
  - Show in more detail what implementation of Options 1 and 2 would look like in BEDES
  - Consider online poll of TWG members on 3 options (since less than half those on phone at NRDC weighed in during the discussion)

There was also some limited discussion on the role that "tagging" might play in the formation and use of the BEDES data spec. There seemed to be multiple views regarding what a tag was and how it could be used. Moreover, the issue of whether a "tag" approach is in the specification or implementation area was not discussed. Some of the tag related comments included:

- There seem to be multiple ideas of what a tag is – The schematic concept LBNL showed is proposing to use syntax identifiers within the already existing description field, using a highly standardized wording format. The concept explores the idea that we can hopefully imbed some information in the description field for each fieldname line item in BEDES, for the purpose to help the specification reader more easily see BEDES fieldname interrelationships without scrolling around in the document. In the provided schematic example, Activity Type is clearly identified as being a sub of Commercial Facility Type, which in turn is a sub within Site. This schematic

concept is presented for the purpose of discussion and the syntax 'tags' are not intended to be fully functional at this point. This concept could be a tool to help keep the overall spec flat.

- Take this example of a more traditional tagging structure you would only have two fields: Commercial Activity Type and Conditioned Floor Area – and then you could select any number of Tags to describe any given commercial activity. All you need to do is define each tag on the fly and assemble them in a list as need.
- Misnomer – the definitions example thing is not a tagging concept in classic implementation sense – still needs to be fleshed out more

There was agreement that LBNL would explore the tag idea further with interested TWG members before the next TWG meeting.

4:15 Agendas/Preparation for Next TWG and Sub-Group Meetings

The next TWG meeting is scheduled for February 25th at LBNL in Berkeley, CA. During the meeting we will attempt to finalize Groups Structure, Prioritization strategy, the Module 1 Sub-Group recommendations, and review workplans for Module 2 Sub-Groups.

Attendance in person or by phone

Name	Organization
Lindsay Robbins	NYSERDA
Magnus Cheifetz	Building Energy
Daniel Studer	NREL
Dane Carey	HB&C
Krishnan Gowri	PNNL
Jon Keck	Bright Power
Supriya Goel	PNNL
Amir Roth	DOE
Jayson Antonoff	IMT
Theddi Chappell	Sustainable Values, Inc
Micah Brill	ULI Greenprint
Christopher Hartley	MelRok, LLC
Noel Merket	NREL
David Wollman	NIST
Aurora Sharrard	Green Building Alliance
Julie Caracino	NHPC
Bob Schultz	PNNL
Jonathan Raab	Raab Associates
Jeff Barnes	San Diego Gas & Electric
Chris Tremper	DOE
Barry Hooper	SF Environment
Marshall Duer-Balkind	Dist. Dept. of the Env., DC
Norm Bourassa	LBNL
Devan Johnson	kW Engineering
Andrew Fritsch	ActioNet
Bob Hendron	NREL
Adam Wallen	Skyfoundry
John Ku	PG&E
Mike Brauch	Actionet/ FEMP
Andrea Mercado	LBNL
Scott Wagner	EEB Hub
Theddi Chappell	Sustainable Values, Inc
Tracy Phillips	7th Gen Energy Solutions
Kevin Settlemyre	Sustainable IQ
Christopher Hartley	MelRok, LLC
Rick Balsano	OPower
John Mejia	LBNL